



## Next Meeting



Christmas BBQ ~ 12.00 Midday  
Sunday 16<sup>th</sup> December



NEVARC Clubroom Belviour Guides Hall  
Silva Drive West Wodonga

*Bring a curious bit of radio equipment you may have to display on a table.  
Feel free to discuss its story, how you got it and what you are going to do with it.*

Latest meeting details found on club website at

<http://nevarc.org.au/>





## ROSEBUD 2018 HAMFEST REPORT ~ Mick VK3CH

The Rosebud Radiofest was another interesting swap meet with the usual traders and hams selling. The lectures and demonstrations were good I was told, but as I was selling I could not attend them. Perfect weather and quiet roads all helped, but attending numbers seemed bit down compared to last year. I am really getting to the last of my junk, about one more year of Hamfests and I will be done clearing out all my unused extras. The only way these days to sell are to have very reduced prices, and then it goes.



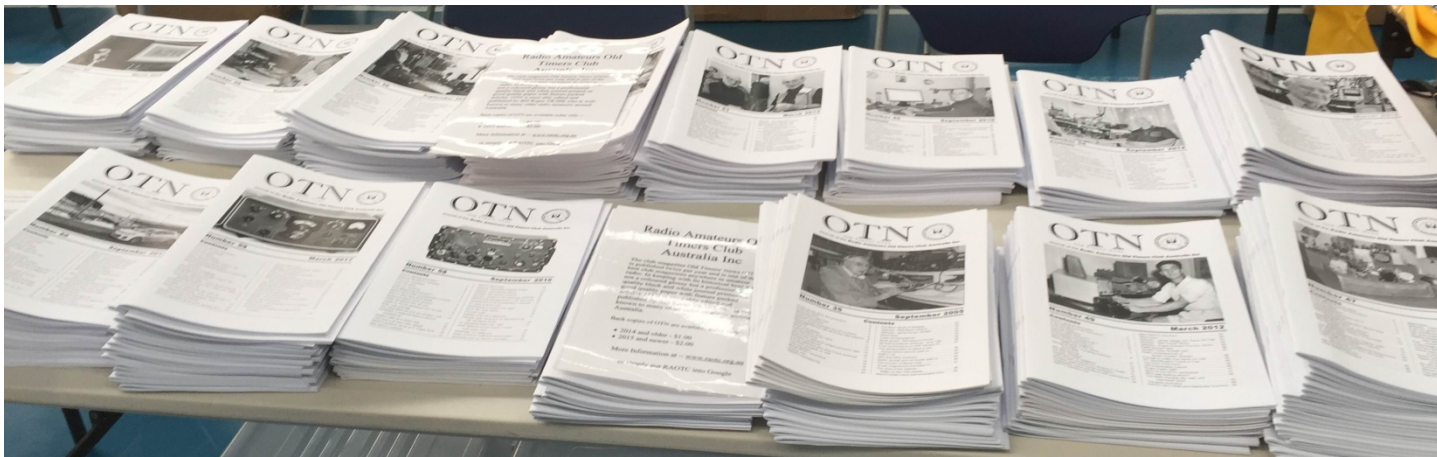
Mick VK3CH five tables of stuff  
Some of it was actually ham radio items, after 2 hours all of the \$5 table items were sold and gone



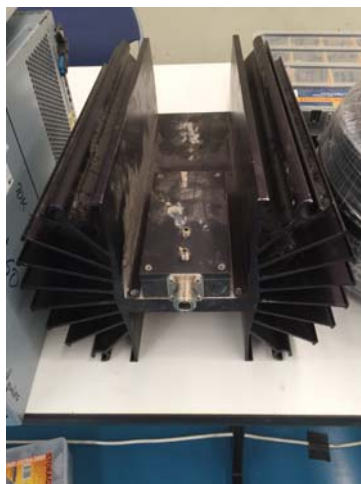
The rest of the pictures tell the story...











# KILOGRAM CHANGE

‘One of science’s most hallowed relics’: Quantum leap for mass as science redefines the kilogram

Sealed in a vault beneath a duke’s former pleasure palace is an object the size of an apple that determines the weight of the world — but not for much longer.

SEALED in a vault beneath a duke’s former pleasure palace among the sycamore-streaked forests west of Paris sits an object the size of an apple that determines the weight of the world.



Forged against a backdrop of scientific and political upheaval following the French Revolution, a single, small cylinder of platinum-iridium alloy has laid largely undisturbed for nearly 130 years as the world’s benchmark for what, precisely, is a kilogram.

The international prototype of the kilogram, or “Le Grand K” as it is tenderly known, is one of science’s most hallowed relics, an analog against which all other weights are compared and a totem of the metric system that accompanied the epoch of liberty, equality and fraternity.

It’s so revered, in fact, that it’s only been weighed four times since 1889 and the room housing it in the Pavillon de Breteuil may only be opened when the three living key holders — who for security reasons must be of different nationalities — turn the lock simultaneously. And yet it’s soon to be out of a job.

Hundreds of scientists from around the world will gather this week in the opulence of Versailles Palace for the 26th General Conference on Weights and Measures.

There, in an act belatedly fulfilling the metric system’s founding promise of “For all ages, for all people”, they will replace the Grand K with a universal formula that defines the kilogram using the quantum laws of nature.

“The kilogram is the last unit of measurement based on a physical object,” said Thomas Grenon, director of France’s National Laboratory of Metrology and Testing.

“The problem is that it’s had a life; it could fluctuate. That’s not good enough, given the level of precision we need today.”

The prototype of the kilogram was manufactured in the 1880s of an alloy of 90 per cent platinum and 10 per cent iridium. Four of the six official copies are dated from the same period.

## WHAT’S IN A SECOND?

With the adoption of the metric system, scientists in the late 18th century needed to codify a single structure that expressed distance, time, electrical processes and mass in similar, transferable, units of measurement.

They defined a metre as one ten millionth of the Earth’s quadrant — running through Paris, naturally.

“We now look back and say actually the process they went through was pretty good, we wouldn’t do it very differently today,” said Dr Martin Milton, director of the BIPM, the international custodian of our measurement systems.

The metre was used in turn to define mass — however much a cubic decimetre (10cm x 10cm x 10cm) of water weighed would henceforth be termed a kilogram. But science has moved on since those days.

A metre is now defined by how far light travels in a vacuum during a fraction of a second.

The second itself used to be expressed relative to the rotation of the Earth. But since the 1960s, it has officially been the time it takes a caesium-133 atom to wobble 9,192,631,770 times — not a revolution less.

Instead of relating to the mass of a singular physical object, the kilogram will in future be defined in terms of the Planck constant — the ratio of quantum energy a frequency of light can carry to that same frequency, or  $6.626 \times 10^{-34}$  joule seconds.

Energy is intrinsically linked to mass, as Einstein demonstrated with his equation  $E = mc^2$ .

The Planck constant, combined with two quantum phenomena which allow for the creation of electrical power, can be used to calculate mass based on the equivalent mechanical power needed to displace it.

“If you push a mass, the power you need is dependent on that mass. And you can completely base that power on electrical power provided by our quantum constants,” Dr Milton said.

Proponents of this approach say it will be at least one million times more stable than physical artefacts and will have a range of practical applications in future.

“For a lot of applications, one kilogram is a very big mass,” Dr Milton said. Advances in pharmaceutical and chemical production mean ingredients in medicines are increasingly measured to the microgram, and are getting ever more precise.

“One kilo’s good for potatoes where you don’t need very much accuracy, but it’s not the right weight for many applications in demanding science and industry. The new system is infinitely scalable.”

A scientist at work on the kibble balance, an electromechanical weight measuring instrument which measures the weight of a test object very precisely by the strength of an electric current and a voltage.

## ‘STATES COMING TOGETHER’

Scientists will also use the Versailles summit to change how the ampere (electrical current), kelvin (temperature) and mole (atoms) are defined, all expressed through the universal laws of nature. Dr Milton said the decision was a way of ensuring that the world would always agree on what, precisely, a kilogram is — be it a bag of sugar, a litre of water or a precise quantum ratio.

“We are in a world where people are concerned that the drive towards multilateralism is halted and possibly reversing. But here, in measurement science, states really do come together to agree,” he said. As for Le Grand K, it may have outlived its usefulness as the perfect kilogram, but its contribution to science is far from over. “It will stay here in the vault in the conditions it has been in since 1889,” Dr Milton said. “It’s actually a long-term experiment because we will weigh it in the decades to come to see how it reacts to the conditions. It continues to be an object of interest to science.”

~Internet



# NEVARC Nets

## 40M Net

Monday, Wednesday and Fridays  
10am Local time (East coast)

7.095 MHz LSB

Hosted by Ron VK3AHR  
Using club call VK3ANE

## 80M Net

Wednesday 20:30 Local time

3.622 MHz LSB

Hosted by Ron VK3AHR  
Using the club call VK3ANE

## 2M Nets

Monday at 2000 local time on  
VK3RWO repeater  
146.975 MHz



Have you ever noticed that all the instruments searching for intelligent life are pointed away from earth?

**Please Note:**  
**CHRISTMAS IS CANCELLED**

Apparently YOU told Santa that  
you've been GOOD this year...



**and he died laughing!**

President, VK2VU, Gary  
Vice President, Vacant  
Secretary, VK2FKLR, Kathleen  
Treasurer, Amy



## NEVARC CLUB PROFILE

### History

The North East Victoria Amateur Radio Club (NEVARC) formed in 2014.  
As of the 7th August 2014, Incorporated, Registered Incorporation number A0061589C.  
NEVARC is an affiliated club of the Wireless Institute of Australia.

### Meetings

Meetings details are on the club website, check for latest scheduled details.  
Meetings held at the Belviour Guides Hall, Silva Drive West Wodonga.

### VK3ANE NETS

#### HF

7.095 MHz Monday, Wednesday, Friday - 10am Local time  
3.622 MHz Wednesday - 8.30pm Local time

#### VHF

VK3RWO Repeater 146.975 MHz – Monday - 8pm Local time  
All nets are hosted by Ron Hanel VK3AHR using the club callsign VK3ANE

### Benefits

To provide the opportunity for Amateur Radio Operators and Short Wave Listeners to enhance their hobby through interaction with other Amateur Radio Operators and Short Wave Listeners. Free technology and related presentations, sponsored construction activities, discounted (and sometimes free) equipment, network of likeminded radio and electronics enthusiasts. Excellent club facilities and environment, ample car parking.

**Website:** [www.nevarc.org.au](http://www.nevarc.org.au)

**Postal:** NEVARC Secretary  
PO Box 69  
Wahgunyah Vic 3683

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All editors' comments and other opinions in submitted articles may not always represent the opinions of the committee or the members of NEVARC, but published in spirit, to promote interest and active discussion on club activities and the promotion of Amateur Radio. Contributions to NEVARC News are always welcome from members.

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While we strive to be accurate, no responsibility taken for errors, omissions, or other perceived deficiencies, in respect of information contained in technical or other articles.

Any dates, times and locations given for upcoming events please check with a reliable source closer to the event.

This is particularly true for pre-planned outdoor activities affected by adverse weather etc.

The club website [http://nevarc.org.au/](http://nevarc.org.au) has current information on planned events and scheduled meeting dates.

You can get the WIA News sent to your inbox each week by simply clicking a link and entering your email address found at [www.wia.org.au](http://www.wia.org.au) The links for either text email or MP3 voice files are there as well as Podcasts and Twitter. This WIA service is FREE.